



Case report

## Fatal aorto-esophageal fistula in child: A case report



Sultan Pehlivan, MD Pathology Specialist <sup>a,\*</sup>,  
Dogus Ozdemir Kara, MD Pathology Specialist <sup>a</sup>,  
Dilhan Turkkan, MD Pathology Specialist <sup>a</sup>, Ramazan Akçan, MD Associate Professor <sup>b</sup>,  
Asude Gokmen, MD Forensic Medicine Specialist <sup>c</sup>,  
Baris Akduman, MD Forensic Medicine Specialist <sup>c</sup>,  
Mustafa Karapirli, MD Forensic Medicine Specialist <sup>c</sup>

<sup>a</sup> Ankara Branch of the Council of Forensic Medicine, Ankara, Turkey

<sup>b</sup> Hacettepe University, Faculty of Medicine, Department of Forensic Medicine, Ankara, Turkey

<sup>c</sup> Ankara Branch of the Council of Forensic Medicine, Ankara, Turkey

### ARTICLE INFO

#### Article history:

Received 2 April 2013

Received in revised form

19 November 2013

Accepted 10 December 2013

Available online 20 December 2013

#### Keywords:

Fatal

Aorto-esophageal fistula

Foreign body

### ABSTRACT

Esophageal foreign body ingestion is especially frequent in childhood and may cause fatal complications in case of late diagnosis and delayed treatment. We present a case of 2-year old girl who was admitted to emergency department with massive bleeding. However, she died due to an unrecognized foreign body resulted an aorto-esophageal fistula.

At autopsy an aorto-esophageal fistula was detected by gross examination. Tissue samples were obtained from the organs and fistula region. In histopathological examination, a calcified body with multinucleated giant cell and surrounding granulation tissue was detected at the bleeding site. An ulcerated fistula tract ran from the intima to the adventitia, passing through layers of esophageal wall was also noticed.

The mortality rate for foreign body ingestion is less than 1%, except in cases of perforation. Therefore the presented case is among rare examples of fatal foreign body ingestions.

© 2014 Elsevier Ltd and Faculty of Forensic and Legal Medicine. All rights reserved.

## 1. Introduction

Esophageal foreign bodies are a common and potentially serious cause of morbidity and mortality in children. The diagnosis and management of foreign body ingestion is not a major clinical problem. However, the clinical diagnosis of occult esophageal foreign bodies can be difficult and result in serious complications.<sup>1–4</sup> Esophageal penetration associated with foreign body ingestion is rare, with a reported incidence of 1–4%.<sup>5</sup> The mortality rate of foreign body ingestion is less than 1%, if diagnosed at the time of perforation.<sup>6–8</sup> In this report, a case of fatal aorto-esophageal fistula caused by foreign body ingestion is presented.

## 2. Case

A 2 years-old girl was admitted to the emergency department with hematemesis. Despite medical intervention she could not be

rescued. According to her clinical history, she suffered from stomach ache a week ago, and she was treated symptomatically for suspected influenza infection.

The autopsy was performed at the Mortuary of Ankara Office of the Council of Forensic Medicin.

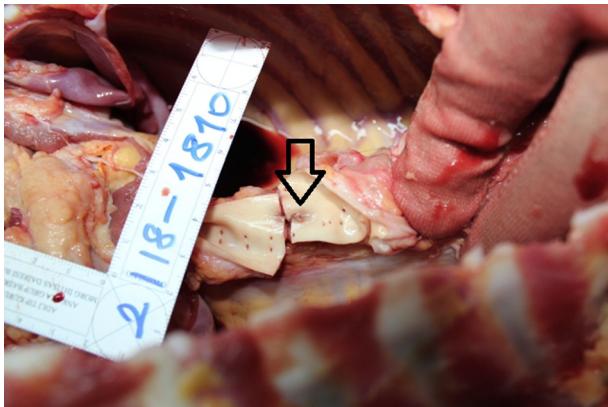
On gross examination during autopsy an aorto-esophageal fistula (1.5 × 1 cm) was detected (Fig. 1). Tissue samples were obtained from the organs and fistula/bleeding site during autopsy. After tissue processing, H&E stained slides were evaluated with light microscopy. Histopathological evaluation revealed a calcified body with multinucleated giant cells and surrounding granulation tissue. In addition, an ulcerated fistula tract running from intima to adventitia, passing through all layers of the esophageal wall was also detected (Figs. 2a, 2b, 2c and 3). Microscopic sections of other internal organs showed no pathology except congestion.

## 3. Discussion

Although retained esophageal foreign bodies might be found throughout childhood, they are more common in infants (>2 years old).<sup>4</sup> Esophageal foreign bodies adhere primarily within the

\* Corresponding author. Ankara Branch of the Council of Forensic Medicine, Sefkat Mah. Felek Cad. No. 45, 06300 Keçiören, Ankara, Turkey. Tel.: +90 3123407324; fax: +90 3123406629.

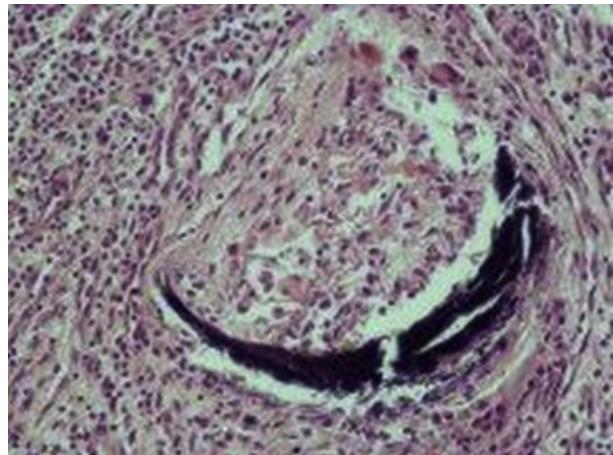
E-mail address: [drspahilivan@hotmail.com](mailto:drspahilivan@hotmail.com) (S. Pehlivan).



**Fig. 1.** Ulcerated fistula tract.

cervical portion of esophagus. In the presented case, a foreign body was detected in portion of the esophagus that is the second most common site of foreign body adherence.<sup>9</sup>

Macpherson et al.<sup>4</sup> reported that out of all esophageal foreign bodies 84% were not food materials; of these 69% were coins, 11% were other metallic objects, and 3% were nonopaque foreign

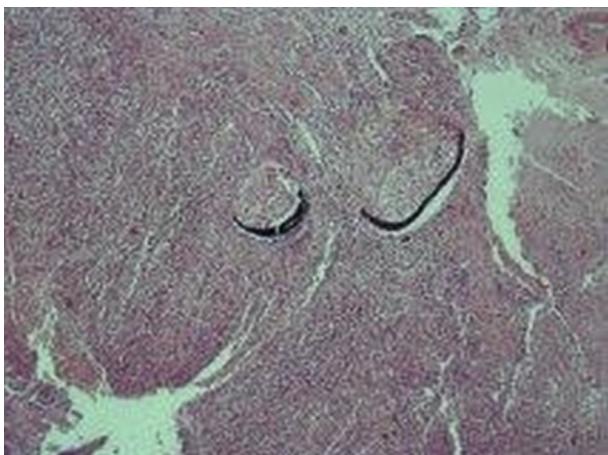


**Fig. 2c.** Calcified body with multinucleated giant cell and granulation tissue around (HE  $\times 200$ ).

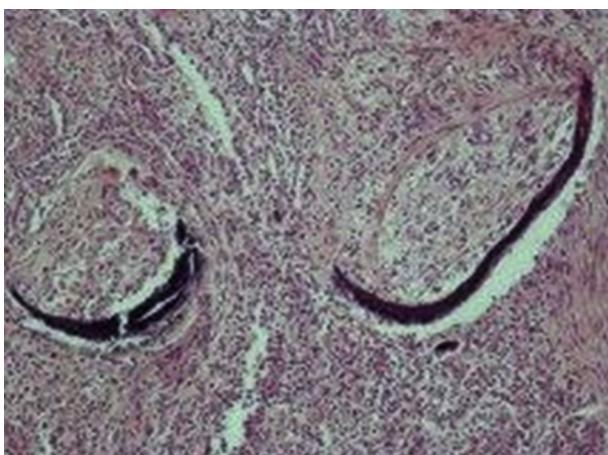
bodies. Of all foreign bodies 16% were food, of which 12% was nonopaque and 4% was opaque materials.

When the major symptoms are compared according to the interval between ingestion and clinical presentation, Macpherson et al. noted that gastrointestinal symptoms predominate in foreign body retentions with shorter duration, while respiratory symptoms were more frequent in retentions with longer duration of time.<sup>4</sup> Esophageal perforation resulting from foreign body ingestion is uncommon, which is reported to be caused by an initial impaction with a foreign body and then a combination of local esophageal wall inflammation with direct pressure necrosis.<sup>10</sup> Perforation of the esophagus by a foreign body usually results in a dramatic clinical picture characterized by odynophagia, dysphagia, respiratory distress, vascular injury and fever.<sup>10,11</sup> Complications of retained esophageal foreign bodies that are primarily related to perforation of the esophagus by the foreign body include mediastinitis with or without abscess, esophagus-to-airway fistulas, esophagus-to-vascular fistulas, extra luminal migration of the foreign body, and false esophageal diverticula. Prolonged retention with obstruction is the cause of true esophageal diverticula.<sup>4,10</sup>

Plain films of the neck and chest can identify radiopaque foreign bodies in the esophagus, but they have proven to be unsatisfactory for detecting ingested nonopaque foreign bodies. Barium studies also seem to be ineffective in detecting ingested nonopaque foreign



**Fig. 2a.** Calcified body with multinucleated giant cell and granulation tissue around (HE  $\times 40$ ).



**Fig. 2b.** Calcified body with multinucleated giant cell and granulation tissue around (HE  $\times 100$ ).



**Fig. 3.** Fistula tract on aorta (HE  $\times 100$ ).

bodies. Computed tomographic (CT) scan is a simple and reliable method for diagnosing esophageal impaction with nonopaque materials, and may decrease the rate of unnecessary esophagoscopies.<sup>12</sup> Unusual foreign bodies (like a fish bone) may follow an atypical tract and might not be detected by chest radiograph or CT scan. It has been reported that once a perforation has been confirmed, a dynamic contrast computed tomogram or archaogram is essential to exclude vascular involvement.<sup>13</sup> Esophagoscopy is suggested as the safest method for esophageal foreign body removal in infants and children.<sup>4</sup>

#### 4. Conclusion

Aorto-esophageal fistulas are an uncommon yet well documented complication that usually results from the ingestion of a sharp object, but that can also occur as a result of erosion of the esophageal wall by blunt foreign bodies after prolonged retention.<sup>4</sup> Unfortunately in our case, the patient dies as a result of massive bleeding from an undiagnosed fistula. A high mortality in the patients with esophageal foreign body perforation results from the lack of clinical suspicion and the late initiation of treatment.

#### Ethical approval

None declared.

#### Funding

No grants or financial support has been obtained for this manuscript.

#### Conflict of interest

None declared.

#### References

1. Newman DE. Radiolucent esophageal foreign body: an often forgotten cause of respiratory symptoms. *J Pediatr* 1978;92:60–3.
2. Remsen K, Lawsen W, Biller HF, Som ML. Unusual presentations of penetrating foreign bodies of the upper aerodigestive system. *Ann Otol Rhinol Laryngol* 1983;92:32–44.
3. Smith CP, Swisschuk LE, Fagan CJ. An elusive, often unsuspected cause of stridor or pneumonia (the esophageal body). *AJR* 1974;122:80–9.
4. Macpherson RI, Hill JG, Othersen HB, Tagge EP, Smith CD. Esophageal foreign bodies in children: diagnosis, treatment and complications. *AJR* 1996;166:919–24.
5. Scher RL, Tegtmeier CJ, McLean WC. Vascular injury following foreign body perforation of the esophagus: review of the literature and report of a case. *Ann Otol Rhinol Laryngol* 1990;99:698–702.
6. Smith MT, Wong RK. Esophageal foreign bodies: types and techniques for removal. *Curr Treat Options Gastroenterol* 2006;9:75–84.
7. Soprano JV, Mandl KD. Four strategies for the management of esophageal coins in children. *Pediatrics* 2000;105:e5.
8. Katsinios P, Kountouras J, Paroutoglou G, Zavos C, Mimidis K, Chatzimavroudis G. Endoscopic techniques and management of foreign body ingestion and food bolus impaction in the upper gastrointestinal tract: a retrospective analysis of 139 cases. *J Clin Gastroenterol* 2006;40:784–9.
9. Sadler TW. *Langman's medical embryology*. 10th ed. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins; 2006p112.
10. Chiu HH, Li JH, Chen JS. Penetration of esophageal wall by a fish bone. *J Intern Med Taiwan* 2006;17:298–301.
11. Nandi P, Ong GB. Foreign body in the esophagus: review of 2394 cases. *Br J Surg* 1978;65:5–9.
12. Eliashar R, Dano I, Dangoor E, Braverman I, Sichel JY. Computed tomography diagnosis of esophageal bone impaction: a prospective study. *Ann Otol Rhinol Laryngol* 1999;108:708–10.
13. Skinner DB, Little AG, DeMeester TR. Management of esophageal perforation. *Am J Surg* 1980;139:760–4.